

In The Claims

Please cancel claim 1 without prejudice or disclaimer of the subject matter recited therein.

Please add the following new claims:

229 1 38. A networking protocol for a network comprising:
2 a protocol packet, wherein
3 said protocol packet is sent from a neighbor node to a node,
4 said neighbor node is a neighbor of said node,
5 said protocol packet is configured to allow said node to determine topology
6 information, and
7 said topology information comprises information regarding a topology of at
8 least a portion of said network.

1 39. The networking protocol of claim 38, wherein said protocol packet comprises:
2 header data; and
3 command-specific data.

1 40. The networking protocol of claim 39, wherein said header data comprises:
2 a flush indicator field.

1 41. The networking protocol of claim 39, wherein said header data further
2 comprises:
3 a terminate path indicator field.

1 42. The networking protocol of claim 39, wherein said header data further
2 comprises:
3 a commit path indicator field.

1 43. The networking protocol of claim 39, wherein said header data comprises:
2 a request/response indicator field.

C29
1 44. The networking protocol of claim 43, wherein said header data further
2 comprises:
3 a negative response indicator field.

1 45. The networking protocol of claim 44, wherein said header data further
2 comprises:
3 a terminate path indicator field.

1 46. The networking protocol of claim 44, wherein said header data further
2 comprises:
3 a commit path indicator field.

1 47. The networking protocol of claim 44, wherein said header data comprises:
2 a flush indicator field.

1 48. The networking protocol of claim 39, wherein said protocol packet is a
2 initialization packet.

1 49. The networking protocol of claim 48, wherein said command-specific data
2 comprises:
3 information regarding a link between said node and said neighbor node.

1 50. The networking protocol of claim 48, wherein said command-specific data
2 comprises:
3 a link cost field.

1 51. The networking protocol of claim 50, wherein said command-specific data
2 further comprises:
3 a quality of service 3 capacity field; and
4 a quality of service n capacity field.

C29
1 52. The networking protocol of claim 50, wherein said command-specific data
2 further comprises:

3 a hello interval field; and
4 a hello dead interval field.

1 53. The networking protocol of claim 39, wherein said protocol packet is a hello
2 packet.

1 54. The networking protocol of claim 53, wherein said command-specific data
2 comprises:

3 a link state advertisement count field.

1 55. The networking protocol of claim 53, wherein said command-specific data
2 further comprises:

3 an advertising node field;
4 an instance identifier field;
5 a hop count field; and
6 a neighbor count field.

1 56. The networking protocol of claim 53, wherein said command-specific data
2 further comprises:

3 a neighbor field; and
4 a link cost field.

1 57. The networking protocol of claim 53, wherein said command-specific data
2 further comprises:

3 a quality of service 3 capacity field; and
4 a quality of service n capacity field.

1 58. The networking protocol of claim 39, wherein said protocol packet is a restore
2 path packet.

C29
1 59. The networking protocol of claim 58, wherein said command-specific data
2 comprises:
3 a virtual path identifier field.

1 60. The networking protocol of claim 59, wherein said command-specific data
2 comprises:
3 a path length field.

1 61. The networking protocol of claim 59, wherein said command-specific data
2 comprises:
3 a path index field; and
4 a path array.

1 62. The networking protocol of claim 39, wherein said protocol packet is a create
2 path packet.

1 63. The networking protocol of claim 62, wherein said command-specific data
2 comprises:
3 a virtual path identifier field;
4 a path length field;
5 a path index field; and
6 a path array.

1 64. The networking protocol of claim 39, wherein said protocol packet is a delete
2 path packet.

1 65. The networking protocol of claim 64, wherein said command-specific data
2 comprises:
3 a virtual path identifier field;
4 a path length field;
5 a path index field; and

6 a path array.

1 66. The networking protocol of claim 39, wherein said protocol packet is a test
2 path packet.

1 67. The networking protocol of claim 66, wherein said command-specific data
2 comprises:

3 a virtual path identifier field;

4 a path length field;

5 a path index field; and

6 a path array.

1 68. The networking protocol of claim 39, wherein said protocol packet is a get link
2 state advertisement packet.

1 69. The networking protocol of claim 39, wherein said protocol packet is a link
2 down packet.

1 70. The networking protocol of claim 39, wherein said protocol packet is a
2 configure packet.

1 71. A computer readable media encoded with a data structure, said data structure
2 comprising:

3 a restore path request entry, wherein said restore path request entry is maintained in
4 response to receipt of a restore path packet.

1 72. The data structure of claim 71, wherein said restore path request entry
2 comprises:

3 an origin node field containing a node id of a node that originated said restore path
4 packet; and

5 a target node field containing a node id of a target node of said restore path packet.

C29
1 73. The data structure of claim 71, wherein said restore path request entry
2 comprises:
3 a received-from field containing a neighbor node from which said restore path packet
4 was received.

1 74. The data structure of claim 71, wherein said restore path request entry
2 comprises:
3 a first sequence number field containing a sequence number of a first received copy of
4 said restore path packet; and
5 a last sequence number field containing a sequence number of a last received copy of
6 said restore path packet.

1 75. The data structure of claim 71, wherein said restore path request entry
2 comprises:
3 a bandwidth field containing data representing a requested bandwidth; and
4 a quality of service field containing data representing a quality of service.

1 76. The data structure of claim 71, wherein said restore path request entry
2 comprises:
3 a timer field containing a timeout for said restore path packet.

1 77. The data structure of claim 71, wherein said restore path request entry
2 comprises:
3 a terminate field containing data to representing that a terminate indicator has been
4 received from a neighbor node.

1 78. The data structure of claim 71, wherein said restore path request entry
2 comprises:
3 a pending replies field containing a count of neighbor nodes that have not
4 acknowledged said restore path packet; and

5 a sent-to field containing data representing a list of neighbor nodes that have received
6 a copy of said restore path packet.

1 79. A method of detecting a failure at a node in a network comprising:
2 periodically determining if a hello packet has been received from a neighbor node; and
3 if said hello packet has not been received from said neighbor node,
4 determining if said hello packet has been received during a period of time, and
5 if said hello packet has not been received during said period of time,
6 performing failure processing.

1 80. The method of claim 79, further comprising:
2 initializing an inactivity counter at said node;
3 if said hello packet has not been received,
4 updating said inactivity counter,
5 comparing said inactivity counter and a hello dead interval, and
6 performing failure processing, if said comparing indicates a path between said
7 node and said neighbor node has failed.

1 81. The method of claim 79, wherein said failure processing comprises:
2 changing a state of said neighbor node from an active state to a down state.

1 82. The method of claim 79, wherein said failure processing comprises:
2 changing a value of a hop count field of a link state advertisement to indicate that said
3 link state advertisement cannot be broadcast to other nodes in said network.

1 83. The method of claim 79, wherein said failure processing comprises:
2 initiating a link state advertisement removal process, wherein said link state
3 advertisement removal process removes a corresponding link state
4 advertisement from a topology database maintained at said node.

C29
1 84. The method of claim 83, wherein said failure processing further comprises:
2 sending said link state advertisement to another neighbor node, wherein said another
3 neighbor node is a neighbor of said node.

1 85. The method of claim 79, wherein said failure processing comprises:
2 sending a link down packet.

1 86. The method of claim 79, wherein said failure processing comprises:
2 sending a get link state advertisement packet.

1 87. A computer system comprising:
2 a processor;
3 computer readable medium coupled to said processor; and
4 computer code, encoded in said computer readable medium, configured to cause said
5 processor to:
6 periodically determine if a hello packet has been received from a neighbor
7 node; and
8 if said hello packet has not been received from said neighbor node,
9 determine if said hello packet has been received during a period of
10 time, and
11 if said hello packet has not been received during said period of time,
12 perform failure processing.

1 88. The computer system of claim 87, wherein said computer code is further
2 configured to cause said processor to:
3 initialize an inactivity counter at said node;
4 if said hello packet has not been received,
5 update said inactivity counter,
6 compare said inactivity counter and a hello dead interval, and
7 perform failure processing, if said comparing indicates a path between said
8 node and said neighbor node has failed.

C29
1 89. The computer system of claim 87, wherein said computer code configured to
2 cause said processor to perform failure processing is further configured to cause said
3 processor to:

4 change a state of said neighbor node from an active state to a down state.

1 90. The computer system of claim 87, wherein said computer code configured to
2 cause said processor to perform failure processing is further configured to cause said
3 processor to:

4 change a value of a hop count field of a link state advertisement to indicate that said
5 link state advertisement cannot be broadcast to other nodes in said network.

1 91. The computer system of claim 87, wherein said computer code configured to
2 cause said processor to perform failure processing is further configured to cause said
3 processor to:

4 initiate a link state advertisement removal process, wherein said link state
5 advertisement removal process removes a corresponding link state
6 advertisement from a topology database maintained at said node.

1 92. The computer system of claim 91, wherein said computer code configured to
2 cause said processor to perform failure processing is further configured to cause said
3 processor to:

4 send said link state advertisement to another neighbor node, wherein said another
5 neighbor node is a neighbor of said node.

1 93. The computer system of claim 87, wherein said computer code configured to
2 cause said processor to perform failure processing is further configured to cause said
3 processor to:

4 send a link down packet.

1 94. The computer system of claim 87, wherein said computer code configured to
2 cause said processor to perform failure processing is further configured to cause said
3 processor to:

4 send a get link state advertisement packet.

1 95. A computer program product encoded in computer readable media, said
2 computer program product comprising:

3 a first set of instructions, executable on a computer system, configured to periodically
4 determine if a hello packet has been received from a neighbor node;

5 a second set of instructions, executable on said computer system, configured to, if said
6 hello packet has not been received from said neighbor node, determine if said
7 hello packet has been received during a period of time; and

8 a third set of instructions, executable on said computer system, configured to, if said
9 hello packet has not been received from said neighbor node and said hello
10 packet has not been received during said period of time, perform failure
11 processing.

1 96. The computer program product of claim 95, further comprising:

2 a fourth set of instructions, executable on said computer system, configured to
3 initialize an inactivity counter at said node; and

4 a fifth set of instructions, executable on said computer system, configured to if said
5 hello packet has not been received,
6 update said inactivity counter,
7 compare said inactivity counter and a hello dead interval, and
8 perform failure processing, if said comparing indicates a path between said
9 node and said neighbor node has failed.

C29
1 97. The computer program product of claim 95, wherein said third set of
2 instructions further comprises:

3 a first sub-set of instructions, executable on said computer system, configured to
4 change a state of said neighbor node from an active state to a down state.

1 98. The computer program product of claim 95, wherein said third set of
2 instructions further comprises:

3 a first sub-set of instructions, executable on said computer system, configured to
4 change a value of a hop count field of a link state advertisement to indicate that
5 said link state advertisement cannot be broadcast to other nodes in said
6 network.

1 99. The computer program product of claim 95, wherein said third set of
2 instructions further comprises:

3 a first sub-set of instructions, executable on said computer system, configured to
4 initiate a link state advertisement removal process, wherein said link state
5 advertisement removal process removes a corresponding link state
6 advertisement from a topology database maintained at said node.

1 100. The computer program product of claim 99, wherein said third set of
2 instructions further comprises:

3 a second sub-set of instructions, executable on said computer system, configured to
4 send said link state advertisement to another neighbor node, wherein said
5 another neighbor node is a neighbor of said node.

1 101. The computer program product of claim 95, wherein said third set of
2 instructions further comprises:

3 a first sub-set of instructions, executable on said computer system, configured to send
4 a link down packet.

C29
1 102. The computer program product of claim 95, wherein said third set of
2 instructions further comprises:
3 a first sub-set of instructions, executable on said computer system, configured to send
4 a get link state advertisement packet.

1 103. An apparatus for detecting a failure at a node in a network comprising:
2 means for periodically determining if a hello packet has been received from a neighbor
3 node;
4 means for determining if said hello packet has been received during a period of time;
5 and
6 means for performing failure processing, if said hello packet has not been received
7 from said neighbor node and if said hello packet has not been received during
8 said period of time.

1 104. The apparatus of claim 103, further comprising:
2 means for initializing an inactivity counter at said node;
3 means for updating said inactivity counter, if said hello packet has not been received,
4 means for comparing said inactivity counter and a hello dead interval, if said hello
5 packet has not been received, and
6 means for performing failure processing, if said hello packet has not been received and
7 if said comparing indicates a path between said node and said neighbor node
8 has failed.

1 105. The apparatus of claim 103, wherein said means for performing failure
2 processing comprises:
3 means for changing a state of said neighbor node from an active state to a down state.

C29
1 106. The apparatus of claim 103, wherein said means for performing failure
2 processing comprises:
3 means for changing a value of a hop count field of a link state advertisement to
4 indicate that said link state advertisement cannot be broadcast to other nodes in
5 said network.

1 107. The apparatus of claim 103, wherein said means for performing failure
2 processing comprises:
3 means for initiating a link state advertisement removal process, wherein said link state
4 advertisement removal process removes a corresponding link state
5 advertisement from a topology database maintained at said node.

1 108. The apparatus of claim 107, wherein said means for performing failure
2 processing further comprises:
3 means for sending said link state advertisement to another neighbor node, wherein said
4 another neighbor node is a neighbor of said node.

1 109. The apparatus of claim 103, wherein said means for performing failure
2 processing comprises:
3 means for sending a link down packet.

1 110. The apparatus of claim 103, wherein said means for performing failure
2 processing comprises:
3 means for sending a get link state advertisement packet.

1 111. A method of processing a get link state advertisement packet comprising:
2 receiving said get link state advertisement packet at a downstream node, wherein
3 said get link state advertisement packet is sent by a sending node,
4 said get link state advertisement packet comprises at least one node identifier,
5 said at least one node identifier identifies a node in a network for which said
6 sending node seeks a link state advertisement, and

7 said downstream node and said sending node are nodes in said network; and
8 sending at least one link state advertisement to said node.

112. The method of claim 111, further comprising:
2 sending an acknowledgement to said downstream node.

113. The method of claim 111, further comprising:
2 building a first list from a link state database maintained at said downstream node,
3 wherein
4 said first list comprises any link state advertisements received from a node
5 other than said sending node, and
6 said at least one link state advertisement is among said any link state
7 advertisements received from said sending node.

114. The method of claim 113, further comprising:
2 building a second list from said link state database, wherein
3 said second list comprises any link state advertisements received from said
4 sending node.

115. The method of claim 114, further comprising:
2 sending a get link state advertisement packet to each node corresponding to one of
3 said link state advertisements in said second list.

116. The method of claim 114, further comprising:
2 indicating link state advertisements in said second list are to be deleted.

117. The method of claim 116, further comprising:
2 deleting each one of said link state advertisements in said second list, if an updated
3 link state advertisement is not received within a period of time.

118. The method of claim 111, further comprising:
identifying said at least one link state advertisement in a link state database maintained
at said downstream node using said at least one node identifier.

119. The method of claim 118, further comprising:
building a first list from said link state database, wherein
said first list comprises any link state advertisements received from a node
other than said sending node, and
said at least one link state advertisement is among said any link state
advertisements received from said sending node.

120. The method of claim 119, further comprising:
building a second list from said link state database, wherein
said second list comprises any link state advertisements received from said
sending node.

121. The method of claim 120, further comprising:
sending a get link state advertisement packet to each node corresponding to one of
said link state advertisements in said second list.

122. The method of claim 120, further comprising:
indicating link state advertisements in said second list are to be deleted.

123. The method of claim 122, further comprising:
deleting each one of said link state advertisements in said second list, if an updated
link state advertisement is not received within a period of time.

124. A computer system comprising:
a processor;
computer readable medium coupled to said processor; and

C29

4 computer code, encoded in said computer readable medium, configured to cause said
5 processor to:
6 receive said get link state advertisement packet at a downstream node, wherein
7 said get link state advertisement packet is sent by a sending node,
8 said get link state advertisement packet comprises at least one node
9 identifier,
10 said at least one node identifier identifies a node in a network for which
11 said sending node seeks a link state advertisement, and
12 said downstream node and said sending node are nodes in said network;
13 and
14 send at least one link state advertisement to said node.

1 125. The computer system of claim 124, wherein said computer code is further
2 configured to cause said processor to:
3 send an acknowledgement to said downstream node.

1 126. The computer system of claim 124, wherein said computer code is further
2 configured to cause said processor to:
3 build a first list from a link state database maintained at said downstream node,
4 wherein
5 said first list comprises any link state advertisements received from a node
6 other than said sending node, and
7 said at least one link state advertisement is among said any link state
8 advertisements received from said sending node.

1 127. The computer system of claim 126, wherein said computer code is further
2 configured to cause said processor to:
3 build a second list from said link state database, wherein
4 said second list comprises any link state advertisements received from said
5 sending node.

C29
1 128. The computer system of claim 127, wherein said computer code is further
2 configured to cause said processor to:
3 send a get link state advertisement packet to each node corresponding to one of said
4 link state advertisements in said second list.

1 129. The computer system of claim 127, wherein said computer code is further
2 configured to cause said processor to:
3 indicate link state advertisements in said second list are to be deleted.

1 130. The computer system of claim 129, wherein said computer code is further
2 configured to cause said processor to:
3 delete each one of said link state advertisements in said second list, if an updated link
4 state advertisement is not received within a period of time.

1 131. The computer system of claim 124, wherein said computer code is further
2 configured to cause said processor to:
3 identify said at least one link state advertisement in a link state database maintained at
4 said downstream node using said at least one node identifier.

1 132. The computer system of claim 131, wherein said computer code is further
2 configured to cause said processor to:
3 build a first list from said link state database, wherein
4 said first list comprises any link state advertisements received from a node
5 other than said sending node, and
6 said at least one link state advertisement is among said any link state
7 advertisements received from said sending node.

1 133. The computer system of claim 132, wherein said computer code is further
2 configured to cause said processor to:
3 build a second list from said link state database, wherein

4 said second list comprises any link state advertisements received from said
5 sending node.

C29
1 134. The computer system of claim 133, wherein said computer code is further
2 configured to cause said processor to:
3 send a get link state advertisement packet to each node corresponding to one of said
4 link state advertisements in said second list.

1 135. The computer system of claim 133, wherein said computer code is further
2 configured to cause said processor to:
3 indicate link state advertisements in said second list are to be deleted.

1 136. The computer system of claim 135, wherein said computer code is further
2 configured to cause said processor to:
3 deleting each one of said link state advertisements in said second list, if an updated
4 link state advertisement is not received within a period of time.

1 137. A computer program product encoded in computer readable media, said
2 computer program product comprising:
3 a first set of instructions, executable on a computer system, configured to receive said
4 get link state advertisement packet at a downstream node, wherein
5 said get link state advertisement packet is sent by a sending node,
6 said get link state advertisement packet comprises at least one node identifier,
7 said at least one node identifier identifies a node in a network for which said
8 sending node seeks a link state advertisement, and
9 said downstream node and said sending node are nodes in said network; and
10 a second set of instructions, executable on said computer system, configured to send at
11 least one link state advertisement to said node.

1 138. The computer program product of claim 137, further comprising:
2 a third set of instructions, executable on said computer system, configured to send an
3 acknowledgement to said downstream node.

C29

139. The computer program product of claim 137, further comprising:
a third set of instructions, executable on said computer system, configured to build a
first list from a link state database maintained at said downstream node,
wherein
said first list comprises any link state advertisements received from a node
other than said sending node, and
said at least one link state advertisement is among said any link state
advertisements received from said sending node.

140. The computer program product of claim 139, further comprising:
a fourth set of instructions, executable on said computer system, configured to build a
second list from said link state database, wherein
said second list comprises any link state advertisements received from said
sending node.

141. The computer program product of claim 140, further comprising:
a fifth set of instructions, executable on said computer system, configured to send a
get link state advertisement packet to each node corresponding to one of said
link state advertisements in said second list.

142. The computer program product of claim 140, further comprising:
a fifth set of instructions, executable on said computer system, configured to indicate
link state advertisements in said second list are to be deleted.

143. The computer program product of claim 142, further comprising:
a sixth set of instructions, executable on said computer system, configured to delete
each one of said link state advertisements in said second list, if an updated link
state advertisement is not received within a period of time.

C 29

1 144. The computer program product of claim 137, further comprising:
2 a third set of instructions, executable on said computer system, configured to identify
3 said at least one link state advertisement in a link state database maintained at
4 said downstream node using said at least one node identifier.

1 145. The computer program product of claim 144, further comprising:
2 a fourth set of instructions, executable on said computer system, configured to build a
3 first list from said link state database, wherein
4 said first list comprises any link state advertisements received from a node
5 other than said sending node, and
6 said at least one link state advertisement is among said any link state
7 advertisements received from said sending node.

1 146. The computer program product of claim 145, further comprising:
2 a fifth set of instructions, executable on said computer system, configured to build a
3 second list from said link state database, wherein
4 said second list comprises any link state advertisements received from said
5 sending node.

1 147. The computer program product of claim 146, further comprising:
2 a sixth set of instructions, executable on said computer system, configured to send a
3 get link state advertisement packet to each node corresponding to one of said
4 link state advertisements in said second list.

1 148. The computer program product of claim 146, further comprising:
2 a sixth set of instructions, executable on said computer system, configured to indicate
3 link state advertisements in said second list are to be deleted.

C29

1 149. The computer program product of claim 148, further comprising:
2 a seventh set of instructions, executable on said computer system, configured to
3 deleting each one of said link state advertisements in said second list, if an
4 updated link state advertisement is not received within a period of time.

1 150. An apparatus for processing a get link state advertisement packet comprising:
2 means for receiving said get link state advertisement packet at a downstream node,
3 wherein
4 said get link state advertisement packet is sent by a sending node,
5 said get link state advertisement packet comprises at least one node identifier,
6 said at least one node identifier identifies a node in a network for which said
7 sending node seeks a link state advertisement, and
8 said downstream node and said sending node are nodes in said network; and
9 means for sending at least one link state advertisement to said node.

1 151. The apparatus of claim 150, further comprising:
2 means for sending an acknowledgement to said downstream node.

1 152. The apparatus of claim 150, further comprising:
2 means for building a first list from a link state database maintained at said downstream
3 node, wherein
4 said first list comprises any link state advertisements received from a node
5 other than said sending node, and
6 said at least one link state advertisement is among said any link state
7 advertisements received from said sending node.

1 153. The apparatus of claim 152, further comprising:
2 means for building a second list from said link state database, wherein
3 said second list comprises any link state advertisements received from said
4 sending node.

C29
1 154. The apparatus of claim 153, further comprising:
2 means for sending a get link state advertisement packet to each node corresponding to
3 one of said link state advertisements in said second list.

1 155. The apparatus of claim 153, further comprising:
2 means for indicating link state advertisements in said second list are to be deleted.

1 156. The apparatus of claim 155, further comprising:
2 means for deleting each one of said link state advertisements in said second list, if an
3 updated link state advertisement is not received within a period of time.

1 157. The apparatus of claim 150, further comprising:
2 means for identifying said at least one link state advertisement in a link state database
3 maintained at said downstream node using said at least one node identifier.

1 158. The apparatus of claim 157, further comprising:
2 means for building a first list from said link state database, wherein
3 said first list comprises any link state advertisements received from a node
4 other than said sending node, and
5 said at least one link state advertisement is among said any link state
6 advertisements received from said sending node.

1 159. The apparatus of claim 158, further comprising:
2 means for building a second list from said link state database, wherein
3 said second list comprises any link state advertisements received from said
4 sending node.

1 160. The apparatus of claim 159, further comprising:
2 means for sending a get link state advertisement packet to each node corresponding to
3 one of said link state advertisements in said second list.

C29
1 161. The apparatus of claim 159, further comprising:
2 means for indicating link state advertisements in said second list are to be deleted.

1 162. The apparatus of claim 161, further comprising:
2 means for deleting each one of said link state advertisements in said second list, if an
3 updated link state advertisement is not received within a period of time.

1 163. A method of processing a get link state advertisement packet comprising:
2 receiving a hello packet at a downstream node, wherein said hello packet comprises a
3 link state advertisement; and
4 processing said link state advertisement.

1 164. The method of claim 163, further comprising:
2 sending an acknowledgement to said downstream node, wherein said
3 acknowledgement acknowledges all link state advertisements in said hello
4 packet.

1 165. The method of claim 163, wherein said processing comprises:
2 determining if said link state advertisement corresponds to an entry in a link state
3 database maintained at said downstream node.

1 166. The method of claim 165, wherein said processing further comprises:
2 if said link state advertisement does not correspond to an entry in a link state database
3 maintained at said downstream node,
4 adding said link state advertisement to said link state database.

1 167. The method of claim 166, wherein said processing further comprises:
2 if said link state advertisement corresponds to an entry in a link state database
3 maintained at said downstream node,

229
4 determining if a node originating said link state advertisement is a node
5 originating a link state advertisement corresponding to said entry in
6 said link state database.

1 168. The method of claim 167, wherein said processing further comprises:
2 if said node originating said link state advertisement is not said node originating said
3 link state advertisement corresponding to said entry in said link state database,
4 adding said link state advertisement to said link state database.

1 169. The method of claim 167, wherein said processing further comprises:
2 if said node originating said link state advertisement is said node originating said link
3 state advertisement corresponding to said entry in said link state database,
4 determining if said link state advertisement is more recent than said link state
5 advertisement corresponding to said entry in said link state database.

1 170. The method of claim 169, wherein said processing further comprises:
2 if said link state advertisement is not more recent than said link state advertisement
3 corresponding to said entry in said link state database,
4 discarding said link state advertisement.

1 171. The method of claim 169, wherein said processing further comprises:
2 if said link state advertisement is more recent than said link state advertisement
3 corresponding to said entry in said link state database,
4 adding said link state advertisement to said link state database.

1 172. The method of claim 169, wherein said determining if said link state
2 advertisement is more recent than said link state advertisement corresponding to said entry in
3 said link state database comprises:
4 determining if a link state identifier of said link state advertisement is the same as a
5 link state identifier of said link state advertisement corresponding to said entry
6 in said link state database.

C29
1 173. The method of claim 172, wherein said determining if said link state
2 advertisement is more recent than said link state advertisement corresponding to said entry in
3 said link state database further comprises:

4 if said link state identifier of said link state advertisement is not the same as said link
5 state identifier of said link state advertisement corresponding to said entry in
6 said link state database,
7 indicating a one of said link state advertisement and said link state
8 advertisement corresponding to said entry in said link state database
9 having a higher link state identifier is more recent.

1 174. The method of claim 172, wherein said determining if said link state
2 advertisement is more recent than said link state advertisement corresponding to said entry in
3 said link state database further comprises:

4 if said link state identifier of said link state advertisement is the same as said link state
5 identifier of said link state advertisement corresponding to said entry in said
6 link state database,
7 determining if a hop count of said link state advertisement is the same as a hop
8 count of said link state advertisement corresponding to said entry in
9 said link state database.

1 175. The method of claim 174, wherein said determining if said link state
2 advertisement is more recent than said link state advertisement corresponding to said entry in
3 said link state database further comprises:

4 if said hop count of said link state advertisement is the same as said hop count of said
5 link state advertisement corresponding to said entry in said link state database,
6 indicating that said link state advertisement and said link state advertisement
7 corresponding to said entry in said link state database are the same.

C29
1 176. The method of claim 174, wherein said determining if said link state
2 advertisement is more recent than said link state advertisement corresponding to said entry in
3 said link state database further comprises:

4 if said hop count of said link state advertisement is not the same as said hop count of
5 said link state advertisement corresponding to said entry in said link state
6 database,
7 indicating that the one of said link state advertisement and said link state
8 advertisement corresponding to said entry in said link state database
9 having a lower hop count is more recent.

1 177. A computer system comprising:

2 a processor;
3 computer readable medium coupled to said processor; and
4 computer code, encoded in said computer readable medium, configured to cause said
5 processor to:
6 receive a hello packet at a downstream node, wherein said hello packet
7 comprises a link state advertisement; and
8 process said link state advertisement.

1 178. The computer system of claim 177, wherein said computer code is further
2 configured to cause said processor to:

3 send an acknowledgement to said downstream node, wherein said acknowledgement
4 acknowledges all link state advertisements in said hello packet.

1 179. The computer system of claim 177, wherein said computer code configured to
2 cause said processor to process said link state advertisement is further configured to cause
3 said processor to:

4 determine if said link state advertisement corresponds to an entry in a link state
5 database maintained at said downstream node.

c29
1 180. The computer system of claim 179, wherein said computer code configured to
2 cause said processor to process said link state advertisement is further configured to cause
3 said processor to:

4 if said link state advertisement does not correspond to an entry in a link state database
5 maintained at said downstream node,
6 add said link state advertisement to said link state database.

1 181. The computer system of claim 180, wherein said computer code configured to
2 cause said processor to process said link state advertisement is further configured to cause
3 said processor to:

4 if said link state advertisement corresponds to an entry in a link state database
5 maintained at said downstream node,
6 determine if a node originating said link state advertisement is a node
7 originating a link state advertisement corresponding to said entry in
8 said link state database.

1 182. The computer system of claim 181, wherein said computer code configured to
2 cause said processor to process said link state advertisement is further configured to cause
3 said processor to:

4 if said node originating said link state advertisement is not said node originating said
5 link state advertisement corresponding to said entry in said link state database,
6 add said link state advertisement to said link state database.

1 183. The computer system of claim 181, wherein said computer code configured to
2 cause said processor to process said link state advertisement is further configured to cause
3 said processor to:

4 if said node originating said link state advertisement is said node originating said link
5 state advertisement corresponding to said entry in said link state database,
6 determine if said link state advertisement is more recent than said link state
7 advertisement corresponding to said entry in said link state database.

C29
1 184. The computer system of claim 183, wherein said computer code configured to
2 cause said processor to process said link state advertisement is further configured to cause
3 said processor to:

4 if said link state advertisement is not more recent than said link state advertisement
5 corresponding to said entry in said link state database,
6 discard said link state advertisement.

1 185. The computer system of claim 183, wherein said computer code configured to
2 cause said processor to process said link state advertisement is further configured to cause
3 said processor to:

4 if said link state advertisement is more recent than said link state advertisement
5 corresponding to said entry in said link state database,
6 add said link state advertisement to said link state database.

1 186. The computer system of claim 183, wherein said computer code configured to
2 cause said processor to process said link state advertisement is further configured to cause
3 said processor to:

4 determine if a link state identifier of said link state advertisement is the same as a link
5 state identifier of said link state advertisement corresponding to said entry in
6 said link state database.

1 187. The computer system of claim 186, wherein said computer code configured to
2 cause said processor to determine if said link state advertisement is more recent than said link
3 state advertisement corresponding to said entry in said link state database is further configured
4 to cause said processor to:

5 if said link state identifier of said link state advertisement is not the same as said link
6 state identifier of said link state advertisement corresponding to said entry in
7 said link state database,

C29
8 indicate a one of said link state advertisement and said link state advertisement
9 corresponding to said entry in said link state database having a higher
10 link state identifier is more recent.

1 188. The computer system of claim 186, wherein said computer code configured to
2 cause said processor to determine if said link state advertisement is more recent than said link
3 state advertisement corresponding to said entry in said link state database is further configured
4 to cause said processor to:

5 if said link state identifier of said link state advertisement is the same as said link state
6 identifier of said link state advertisement corresponding to said entry in said
7 link state database,
8 determine if a hop count of said link state advertisement is the same as a hop
9 count of said link state advertisement corresponding to said entry in
10 said link state database.

1 189. The computer system of claim 188, wherein said computer code configured to
2 cause said processor to determine if said link state advertisement is more recent than said link
3 state advertisement corresponding to said entry in said link state database is further configured
4 to cause said processor to:

5 if said hop count of said link state advertisement is the same as said hop count of said
6 link state advertisement corresponding to said entry in said link state database,
7 indicate that said link state advertisement and said link state advertisement
8 corresponding to said entry in said link state database are the same.

1 190. The computer system of claim 188, wherein said computer code configured to
2 cause said processor to determine if said link state advertisement is more recent than said link
3 state advertisement corresponding to said entry in said link state database is further configured
4 to cause said processor to:

5 if said hop count of said link state advertisement is not the same as said hop count of
6 said link state advertisement corresponding to said entry in said link state
7 database,

C29
8 indicating that the one of said link state advertisement and said link state
9 advertisement corresponding to said entry in said link state database
10 having a lower hop count is more recent.

1 191. A computer program product encoded in computer readable media, said
2 computer program product comprising:
3 a first set of instructions, executable on a computer system, configured to receive a
4 hello packet at a downstream node, wherein said hello packet comprises a link
5 state advertisement; and
6 a second set of instructions, executable on said computer system, configured to
7 process said link state advertisement.

1 192. The computer program product of claim 191, further comprising:
2 a third set of instructions, executable on said computer system, configured to send an
3 acknowledgement to said downstream node, wherein said acknowledgement
4 acknowledges all link state advertisements in said hello packet.

1 193. The computer program product of claim 191, wherein said second set of
2 instructions comprises:
3 a first sub-set of instructions, executable on said computer system, configured to
4 determine if said link state advertisement corresponds to an entry in a link state
5 database maintained at said downstream node.

1 194. The computer program product of claim 193, wherein said second set of
2 instructions further comprises:
3 a second sub-set of instructions, executable on said computer system, configured to, if
4 said link state advertisement does not correspond to an entry in a link state
5 database maintained at said downstream node,
6 add said link state advertisement to said link state database.

C29
1 195. The computer program product of claim 194, wherein said second set of
2 instructions further comprises:

3 a third sub-set of instructions, executable on said computer system, configured to, if
4 said link state advertisement corresponds to an entry in a link state database
5 maintained at said downstream node,
6 determine if a node originating said link state advertisement is a node
7 originating a link state advertisement corresponding to said entry in
8 said link state database.

1 196. The computer program product of claim 195, wherein said second set of
2 instructions further comprises:

3 a fourth sub-set of instructions, executable on said computer system, configured to, if
4 said node originating said link state advertisement is not said node originating
5 said link state advertisement corresponding to said entry in said link state
6 database,
7 add said link state advertisement to said link state database.

1 197. The computer program product of claim 195, wherein said second set of
2 instructions further comprises:

3 a fourth sub-set of instructions, executable on said computer system, configured to, if
4 said node originating said link state advertisement is said node originating said
5 link state advertisement corresponding to said entry in said link state database,
6 determine if said link state advertisement is more recent than said link state
7 advertisement corresponding to said entry in said link state database.

1 198. The computer program product of claim 197, wherein said second set of
2 instructions further comprises:

3 a fifth sub-set of instructions, executable on said computer system, configured to, if
4 said link state advertisement is not more recent than said link state
5 advertisement corresponding to said entry in said link state database,

6 discard said link state advertisement.

1 199. The computer program product of claim 197, wherein said second set of
2 instructions further comprises:

3 a sixth sub-set of instructions, executable on said computer system, configured to, if
4 said link state advertisement is more recent than said link state advertisement
5 corresponding to said entry in said link state database,
6 add said link state advertisement to said link state database.

1 200. The computer program product of claim 197, wherein said second set of
2 instructions further comprises:

3 a sixth sub-set of instructions, executable on said computer system, configured to
4 determine if a link state identifier of said link state advertisement is the same
5 as a link state identifier of said link state advertisement corresponding to said
6 entry in said link state database.

1 201. The computer program product of claim 200, wherein said fourth sub-set of
2 instructions further comprises:

3 a first sub-sub-set of instructions, executable on said computer system, configured to,
4 if said link state identifier of said link state advertisement is not the same as
5 said link state identifier of said link state advertisement corresponding to said
6 entry in said link state database,
7 indicate a one of said link state advertisement and said link state advertisement
8 corresponding to said entry in said link state database having a higher
9 link state identifier is more recent.

1 202. The computer program product of claim 200, wherein said fourth sub-set of
2 instructions further comprises:

3 a first sub-sub-set of instructions, executable on said computer system, configured to,
4 if said link state identifier of said link state advertisement is the same as said

C29

link state identifier of said link state advertisement corresponding to said entry in said link state database,
determine if a hop count of said link state advertisement is the same as a hop count of said link state advertisement corresponding to said entry in said link state database.

203. The computer program product of claim 202, wherein said fourth sub-set of instructions further comprises:

a second sub-sub-set of instructions, executable on said computer system, configured to, if said hop count of said link state advertisement is the same as said hop count of said link state advertisement corresponding to said entry in said link state database,
indicate that said link state advertisement and said link state advertisement corresponding to said entry in said link state database are the same.

204. The computer program product of claim 202, wherein said fourth sub-set of instructions further comprises:

a second sub-sub-set of instructions, executable on said computer system, configured to, if said hop count of said link state advertisement is not the same as said hop count of said link state advertisement corresponding to said entry in said link state database,
indicating that the one of said link state advertisement and said link state advertisement corresponding to said entry in said link state database having a lower hop count is more recent.

205. An apparatus for processing a get link state advertisement packet comprising:
means for receiving a hello packet at a downstream node, wherein said hello packet comprises a link state advertisement; and
means for processing said link state advertisement.

C29

1 206. The apparatus of claim 205, further comprising:
2 means for sending an acknowledgement to said downstream node, wherein said
3 acknowledgement acknowledges all link state advertisements in said hello
4 packet.

1 207. The apparatus of claim 205, wherein said means for processing comprises:
2 means for determining if said link state advertisement corresponds to an entry in a link
3 state database maintained at said downstream node.

1 208. The apparatus of claim 207, wherein said means for processing further
2 comprises:
3 means for adding said link state advertisement to a link state database, if said link state
4 advertisement does not correspond to an entry in a link state database
5 maintained at said downstream node.

1 209. The apparatus of claim 208, wherein said means for processing further
2 comprises:
3 means for determining if a node originating said link state advertisement is a node
4 originating a link state advertisement corresponding to an entry in a link state
5 database, if said link state advertisement corresponds to said entry in said link
6 state database maintained at said downstream node.

1 210. The apparatus of claim 209, wherein said means for processing further
2 comprises:
3 means for adding said link state advertisement to said link state database, if said node
4 originating said link state advertisement is not said node originating said link
5 state advertisement corresponding to said entry in said link state database.

C 29
1 211. The apparatus of claim 209, wherein said means for processing further
2 comprises:

3 means for determining if said link state advertisement is more recent than said link
4 state advertisement corresponding to said entry in said link state database, if
5 said node originating said link state advertisement is said node originating said
6 link state advertisement corresponding to said entry in said link state database.

1 212. The apparatus of claim 211, wherein said means for processing further
2 comprises:

3 means for discarding said link state advertisement, if said link state advertisement is
4 not more recent than said link state advertisement corresponding to said entry
5 in said link state database.

1 213. The apparatus of claim 211, wherein said means for processing further
2 comprises:

3 means for adding said link state advertisement to said link state database, if said link
4 state advertisement is more recent than said link state advertisement
5 corresponding to said entry in said link state database.

1 214. The apparatus of claim 211, wherein said means for determining if said link
2 state advertisement is more recent than said link state advertisement corresponding to said
3 entry in said link state database comprises:

4 means for determining if a link state identifier of said link state advertisement is the
5 same as a link state identifier of said link state advertisement corresponding to
6 said entry in said link state database.

1 215. The apparatus of claim 214, wherein said means for determining if said link
2 state advertisement is more recent than said link state advertisement corresponding to said
3 entry in said link state database further comprises:

4 means for indicating a one of said link state advertisement and said link state
5 advertisement corresponding to said entry in said link state database having a

6 higher link state identifier is more recent, if said link state identifier of said link
7 state advertisement is not the same as said link state identifier of said link state
8 advertisement corresponding to said entry in said link state database.

C29
1 216. The apparatus of claim 214, wherein said means for determining if said link
2 state advertisement is more recent than said link state advertisement corresponding to said
3 entry in said link state database further comprises:

4 means for determining if a hop count of said link state advertisement is the same as a
5 hop count of said link state advertisement corresponding to said entry in said
6 link state database, if said link state identifier of said link state advertisement is
7 the same as said link state identifier of said link state advertisement
8 corresponding to said entry in said link state database.

1 217. The apparatus of claim 216, wherein said means for determining if said link
2 state advertisement is more recent than said link state advertisement corresponding to said
3 entry in said link state database further comprises:

4 means for indicating that said link state advertisement and said link state
5 advertisement corresponding to said entry in said link state database are the
6 same, if said hop count of said link state advertisement is the same as said hop
7 count of said link state advertisement corresponding to said entry in said link
8 state database.

1 218. The apparatus of claim 216, wherein said means for determining if said link
2 state advertisement is more recent than said link state advertisement corresponding to said
3 entry in said link state database further comprises:

4 means for indicating that the one of said link state advertisement and said link state
5 advertisement corresponding to said entry in said link state database having a
6 lower hop count is more recent, if said hop count of said link state
7 advertisement is not the same as said hop count of said link state advertisement
8 corresponding to said entry in said link state database.